Working Management Guidance for Northern Goshawk Nesting Areas

(for lands where WDNR conducts, funds, or approves activities with the potential to affect Northern Goshawks)

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Project Background

Updating Forest Stand Data. After reviewing the "Draft" Northern Goshawk Management Guidelines, staff from the Division of Forestry noted that some of the State Forest inventory data (i.e., Recon data) used to generate those guidelines were outdated. To check accuracy and update stand data, State Forest and Forest Raptor Working Group (FRWG) staff inventoried stands within 1000 feet of all known goshawk nests (n = 12) on State Forest lands. In addition to nests on State Forests, the 2004 "Draft" guidelines were developed from nests on Federal (n = 29) and County (n = 1) properties.

New stand data were collected from August 2004 to February 2005 at 12 State Forest sites. Sampling methods included a normal reconnaissance cruise (WDNR 2004), cubic cruise (J. Halvorson and J. Olsen, personal communications), and a standard forest wildlife habitat inventory (modified from James and Shugart 1970; Titus and Mosher 1981; Rosenfield et. al., 1998). Field data from each nest area are provided in Appendix 1.

New Data. Summaries of US Forest Service, County, and the updated State Forest data were slightly different than those used to generate the original draft management guidelines. Mean stand DBH decreased (11.7 to 11.0 in), mean stand basal area increased (108 to 112 ft^2/ac), and mean stand area increased (72 to 83 ac; Table 1). Differences among variables were even greater when the State Forest data were examined independently (e.g., mean basal area increased from 106 to 120 ft^2/ac, mean DBH decreased from 13 to 11 in, and mean nest stand area increased from 89 to 118 acres). These results suggest that the original "draft" management guidelines are still valid and that only slight adjustments are warranted.

This project served to confirm the goshawk habitat requirements that had been previously reported. Based on studies in Wisconsin and elsewhere, goshawks are habitat generalists that tend to select nesting areas with structural characteristics of late-successional forests (reviewed in Andersen et al. 2004). When a nesting area is located near forest management activities, adherence to the following guidelines will help to protect and retain breeding goshawks in that area.

Proposed Management Guidelines

1. No-cut Area. In all forest types, create a no-cut buffer around the active and any alternative nest trees; the area of no-cut depends on stand type, conifer density, topology, and distance to sale boundary. The recommended minimum no-cut radius is 660 feet around all nest trees. This distance provides a no-cut area of 31 acres for a territory with one nest. The no-cut buffer is designed to eliminate disturbance within the nest area and reduce the impact of weather on nesting birds. This reserve area also will reduce the likelihood of predation and interspecific competition from red-tailed hawks and great horned owls. All these factors have been shown to negatively affect or eliminate nesting goshawks in established territories.

2. Residual Basal Area. In addition to the no-cut buffer, when unevenage harvests or thinnings are prescribed, maintain residual basal areas higher than is typical for these types of harvests within the nest stand area or possibly throughout the nest area (i.e., 1000 foot radius of the nest tree or center of nest area). At this time the best available information is to retain 70% of the nest area's pre-harvest basal area. For example, a stand with preharvest basal area of

140 ft^2/ac could be thinned to 98 ft^2/ac basal area. The nest area size (i.e., a 1000 foot radius circle) is the mean nest area size (approximately 72 acres) of known goshawk territories in Wisconsin and is similar to the nest area size reported in other goshawk studies (see Finn et al. 2002.)

3. Breeding Season Disturbances. Limit harvesting, loading, hauling, and road/trail building activities within the nest area (i.e., 1,000 ft radius) to periods that minimize disturbance to adults and nestlings. Restrict these activities from February 1 to August 1. (February1 to June 1 is most critical). This guideline is proposed because goshawks are most susceptible to human-caused disturbance during the breeding season. Significant disturbance over a prolonged period will likely cause failure of a breeding attempt and may result in complete territory abandonment.

4. Confine Nearby Disturbances to One Year. Limit timber harvesting, loading, hauling, and road/trail building within the nest area (i.e., 1000 foot radius of the nest tree) to one-year during a timber sale period. This guideline is intended to limit the duration of human disturbance near goshawk nests. Multiple years of disturbance in succession is likely to cause goshawks to abandon the nest area.

Figure 1 illustrates guideline distances and areas for one and two-nest territories.

Justification for Guideline Updates and Remaining Knowledge Gaps.

1. No-cut Area. To our knowledge, no science-based evaluation of the minimum or maximum no-cut area has been completed. Past reports have been anecdotal and are usually based on a single area encounter or observation. The FRWG has documented that a 300 ft no-cut buffer is insufficient too protect goshawks from management-related disturbances. Currently, all agencies and organizations that provide management guidelines for goshawks include a no-cut, or reserve area, around all known nest trees (e.g., Chequamegon-Nicolet National Forest uses a 30-acre minimum no-cut area around all nest trees).

   From 2002-05, the FRWG staff worked with each land manager to develop no-cut areas that were based on the unique physical characteristics of each site. This process resulted in no-cut areas that were smaller than what are proposed here. Concerns have been expressed about this process due to inconsistent interpretation of the previous 2004 management guidelines. To alleviate these concerns, we propose a standardized minimum no-cut area of 31 acres (or 660 ft radius buffer around all nest trees) that land managers can apply without FRWG input. This guideline will be evaluated (based on continued funding) annually by the Forest Raptor Working Group and revised if needed based on current data.

2. Residual Basal Area. Goshawks will occupy forest stands with a wide-range of structural characteristics (e.g., basal area range = 60-191; Table 1). Penteriani and Faivre (2001) reported that 87.5% of the goshawk pairs moved away from nesting areas only when >30% of the original stand was removed. Thus, a residual basal area greater than or equal to 70% of the preharvest basal area, within the “70% retention zone” (Figure 1), should minimize the effects of harvesting on the territorial pair. Continued support for the long-term evaluation of goshawk guidelines is necessary to determine if the 70% threshold is applicable in Wisconsin.

Literature Cited

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Table 1. Forest stand inventory data from US Forest Service (N=29), State (N=12) and County (N=1) Managed properties used to develop management guidance for Northern Goshawk nesting areas in Wisconsin.

Territory ID	Land Owner	Area (acres)	Primary Type	Density Index	BA ft^2/ac	**2005 BA ft^2/ac**	Stand DBH (in)	**2005 Ave. DBH (in)**	Original Survey Year	Comments **(Site Name)**
047	FS	190	O (red)	9	120		10		1993	
053	FS	10	A	6	80		6		1983	
072	FS	12	NH	6	140		10		1993	
071	FS	89	NH	8	60		12		1991	
030	FS	37	NH	9	100		11		1984	
021	FS	47	BW	5	60		9		1999	
022	FS	31	HH	6	140		9		1984	
031	FS	31	HH	6	140		9		1984	
032	FS	114	HH	7	80		9		1994	
077	FS	24	SC	9	120		12		1994	swamp edge
033	FS	52	NH	6	104		10		1990	
027	FS	45	NH	9	90		12		1985	sugar maple/bass
028	FS	68	HH	9	115		12		1991	
100	FS	97	NH	9	103		12		1996	
044	FS	95	NH	9	93		11		1991	S Maple/Bass
026	FS	45	NH	9	85		12		1991	S Maple/Bass
025	FS	30	NH	9	73		12		1992	S Maple/Bass
093	FS	178	NH	9	80		14		1996	
007	FS	25	NH	9	110		12		1985	
075	FS	162	NH	6	110		9		1981	
098	FS	23	BW	9	140		14		1981	Cedar/aspen/birch
041	FS	54	NH	6	140		10		1993	Sugar Maple
024	FS	194	NH	6	110		10		1992	S. Maple/Y. Birch
019	FS	56	HH	9	150		14		1993	
085	FS	37	HH	9	156		16		1993	
086	FS	86	NH	9	108		14		1996	S Maple
095	FS	67	NH	6	119		10		1993	S Maple/Bass
017	FS	85	NH	7	111		10		1997	S Maple/Bass
018	FS	148	NH	9	140		11		1997	Mixed
94	County	87	NH		100		10		1997	
078	State	113	NH	1	107	**115**	12	**11**	1989	
079	State	249	NH	2	95	**140**	10	**11**	1996	
084	State	36	NH	2	94	**109**	13	**8**	1981	
006	State	85	NH	2	115	**128**	20	**11**	1977	
001	State	15	HH	3	120	**91**	14	**10**	1976	
004	State	118	NH	2	95	**111**	15	**14**	1976	
005	State	67	HH	3	120	**119**	13	**11**	1979	
050	State	39	HH	3	115	**191**	15	**16**	1979	
076	State	76	NH	3	91	**89**	9	**10**	1991	
120	State	257	OR	2	80	**117**	9	**9**		
114	State	124	HH	2	100	**131**	16	**13**	1977	
95	State		PW			**105**		**10**		
Mean		83			108	**112**	11.7	**11**	1989	
Median		67			108	**111**	12	**11**	1991	
SD		62.4			23.5	**27**	2.6	**2.1**	7	
Range		10-257			60-156	**60-191**	6-20	**6-20**		
95% CIs		59-95			101-115	**103-121**	10.8-12.4	**10.3-11.7**		

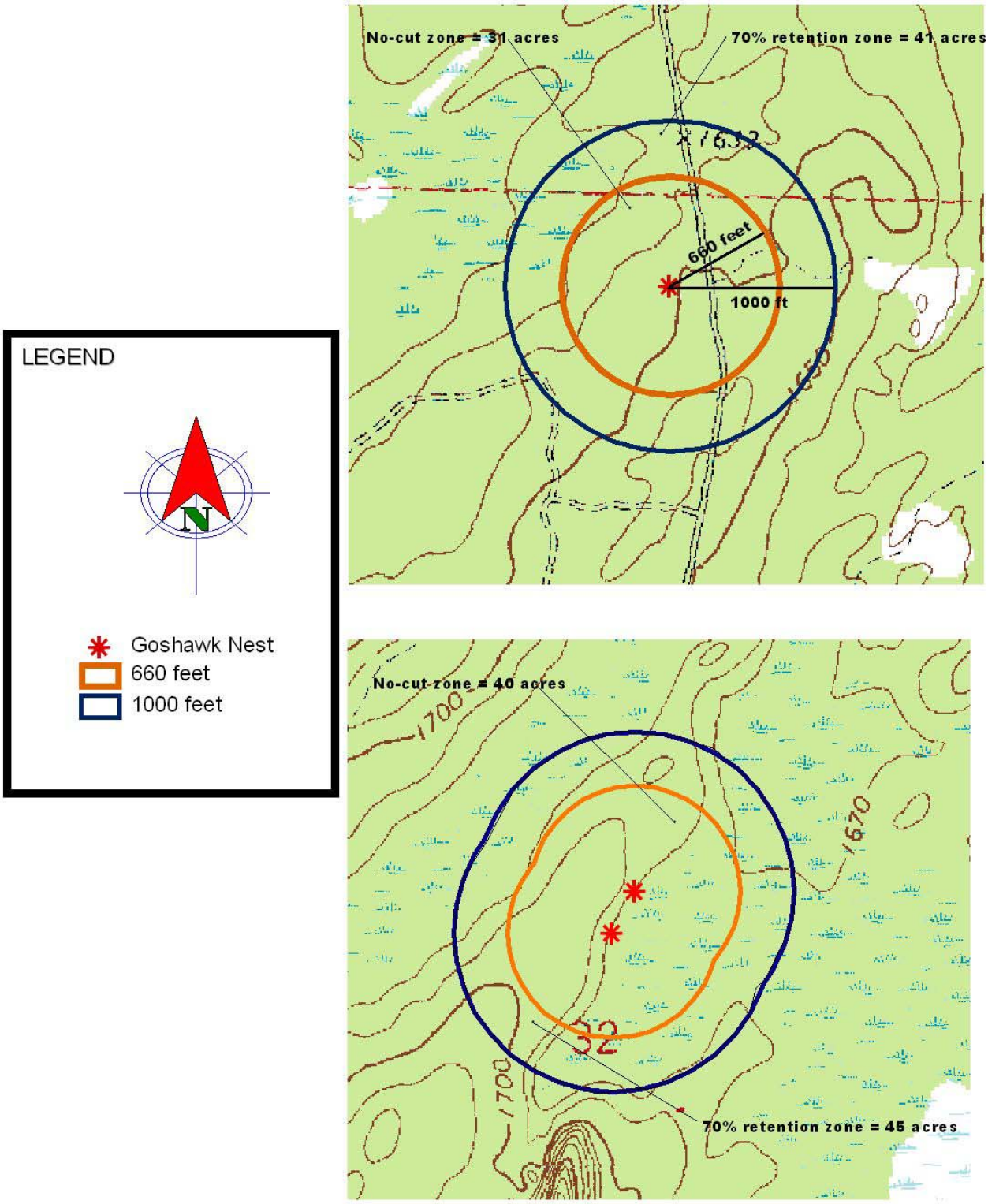

Figure 1. Proposed minimum management zones for Northern Goshawk nesting areas with one (top) and two (bottom) nest trees.